

CLAIMS

10/673366

What is claimed is:

1. An assembly for use with a printed circuit board (PCB), the assembly comprising:
 - a relay assembly including a relay housing and a trip free reset assembly mounted within the housing and linked to other relay components mounted
 - 5 within the housing for manually resetting the relay after the relay is tripped; and
 - at least one pin linked to at least one of the relay components and including a distal end extending from the housing and suitable for direct connection to the PCB.
2. The assembly of claim 1 further including a manual trip assembly mounted within the housing and linked to other relay components for manually tripping the relay when the relay is set.
3. The assembly of claim 2 wherein the relay includes at least one normally closed contact and a manual open circuit member assembly mounted within the housing to other relay components for manually momentarily opening the at least one normally closed contact.
4. The assembly of claim 3 wherein the reset assembly, the trip assembly and the open circuit assembly include reset, trip and open circuit members for activating the assemblies, respectively, and, wherein each of the reset member, the trip member and the open circuit member are provided within the first wall member.
5. The assembly of claim 4 wherein the housing further includes at least a second wall member opposite the first wall member and wherein the at least one pin extends from the second wall member.
6. The assembly of claim 5 wherein the at least one pin includes a plurality of pins and wherein each of the pins extends from the second wall member in substantially the same direction.

7. The assembly of claim 6 for use with a PCB that forms PCB traces having a specific pattern wherein the at least one pin includes at least two pins and wherein the at least two pins are juxtaposed so as to be directly linkable to at least two suitable PCB traces.

8. The assembly of claim 6 for use with a PCB that forms a plurality of apertures and wherein the at least one pin includes at least two pins and the at least two pins are juxtaposed so as to be receivable within at least two of the apertures.

9. The assembly of claim 5 for use with a PCB that forms a substantially flat mounting surface and wherein at least a portion of the second wall member defines a substantially flat housing plane wherein the housing plane abuts the mounting surface when the assembly is mounted to the PCB and, wherein, the reset member moves along an activation axis that is substantially perpendicular to the housing plane when activated.

10. The assembly of claim 1 wherein the reset assembly includes a reset member for activating the reset assembly and wherein the reset member moves along an activation axis when activated, the at least one pin includes a distal end and wherein, the distal end of the at least one pin is substantially perpendicular to the activation axis.

11. The assembly of claim 10 wherein the housing member supports the at least one pin and the reset member.

12. The assembly of claim 11 wherein the housing member includes at least first and second oppositely facing wall members, the reset member provided in the first wall member, at least a portion of the second wall member forming a housing plane that is substantially perpendicular to the activation axis.

13. The assembly of claim 12 for use with a PCB that forms a substantially flat mounting surface, the distal end of the at least one pin extending past the

housing plane such that when the housing plane abuts the mounting surface, the distal end is directly linkable to the PCB.

14. The assembly of claim 13 wherein the at least one pin includes a plurality of pins having distal ends that extend in the same direction and that are essentially perpendicular to the housing plane.

15. The assembly of claim 1 wherein the relay assembly is a bi-stable relay
5 assembly.

16. A method for configuring a relay/printed circuit board (PCB) assembly, the method comprising the steps of:

providing a PCB including electrical traces;

providing a relay assembly including a relay housing and a trip free
5 reset assembly mounted within the housing and linked to other relay components
mounted within the housing for manually resetting the relay after the relay is tripped,
the relay assembly also including at least one pin linked to at least one of the other
relay components and including a distal end that extends from the housing; and
linking the distal end directly to at least one of the electrical traces on
10 the PCB.

17. The method of claim 16 wherein the step of providing a relay assembly
includes the steps of providing a relay where the trip free reset assembly includes a
reset member for activating the reset and providing the housing including at least
first and second oppositely facing wall members wherein the relay member is in the
5 first wall member and the at least one pin extends from the second wall member.

18. The method of claim 17 wherein the step of providing a PCB includes
providing a PCB that forms PCB traces having a specific pattern, the step of
providing a relay assembly including providing a relay having at least two pins
juxtaposed so as to be directly linkable to at least two different PCB traces.

19. The method of claim 16 wherein the step of providing a relay assembly
includes providing a relay assembly including at least one normally closed contact, a
manual trip assembly including a manual trip member for activating the manual trip
assembly, the manual trip assembly linked to other relay components for tripping the
5 relay when the relay is set and a manual open circuit assembly including a manual
open circuit member for activating the manual open circuit assembly, the manual
open circuit assembly linked to other relay components for momentarily opening the
at least one normally closed contact when activated.

20. The method of claim 16 wherein the step of providing a relay assembly
includes providing a trip free reset assembly including a trip free reset member for

activating the trip free reset wherein the reset member moves along an activation axis when activated, the at least one pin including a distal end and wherein, the
5 distal end of the at least one pin is substantially perpendicular to the activation axis.

21. The method of claim 20 wherein the housing supports the at least one pin and the reset member.

22. The method of claim 21 wherein the housing includes at least first and second oppositely facing wall members, the reset member provided in the first wall member, at least a portion of the second wall member forming a housing plane that is substantially perpendicular to the activation axis.

23. The method of claim 22 wherein the step of providing a PCB includes providing a PCB that forms a substantially flat mounting surface, the step of providing a relay assembly including providing a relay assembly where the distal end of the at least one pin extends past the housing plane such that when the housing
5 plane abuts the mounting surface, the distal end is directly linkable to the PCB.

24. The method of claim 16 wherein the step of providing the relay assembly includes providing a bi-stable relay assembly.

25. An assembly for use with a printed circuit board (PCB), the assembly comprising:

a relay assembly including a relay housing and a trip free reset assembly mounted within the housing and linked to other relay components mounted within the housing for manually resetting the relay after the relay is tripped, the reset assembly including a reset member selectable for activating a trip free reset, the reset member moving along an activation axis when activated; and

at least one pin linked to at least one of the relay components and including a distal end suitable for direct connection to the PCB, the pin extending in a direction substantially parallel to the activation axis and from the housing.

26. The assembly of claim 25 wherein the housing includes at least first and second oppositely facing wall members, the reset member provided in the first wall member, at least a portion of the second wall member forming a housing plane that is substantially perpendicular to the activation axis.

27. The assembly of claim 26 for use with a PCB that forms a substantially flat mounting surface, the distal end of the at least one pin extending past the housing plane such that when the housing plane abuts the mounting surface, the distal end is directly linkable to the PCB.

28. The assembly of claim 25 wherein the relay assembly is a bi-stable relay assembly.

29. A relay-printed circuit board (PCB) assembly comprising:
a PCB including a pattern of traces;
a relay assembly including a relay housing and a trip free reset
assembly mounted within the housing and linked to other relay components mounted
5 within the housing for manually resetting the relay after the relay is tripped; and
at least one pin linked to at least one of the relay components and
including a distal end extending from the housing and directly linked to at least one
of the traces.

30. The assembly of claim 29 wherein the reset assembly includes a reset
member for activating the reset assembly, the reset member moving along an
activation axis when activated, the at least one pin including a distal end linked to the
PCB and wherein, the distal end of the at least one pin is substantially perpendicular
5 to the activation axis.

31. The assembly of claim 30 wherein the housing includes at least first
and second oppositely facing wall members, the reset member provided in the first
wall member, at least a portion of the second wall member forming a housing plane
that is substantially perpendicular to the activation axis.

32. The assembly of claim 31 wherein the PCB forms a substantially flat
mounting surface, the distal end of the at least one pin extends past the housing
plane such that when the housing plane abuts the mounting surface, the distal end is
directly linkable to the PCB.

33. The assembly of claim 32 wherein the at least one pin extends from the
second wall member in a direction substantially perpendicular thereto.

34. The assembly of claim 29 wherein the relay assembly is a bi-stable
relay assembly.

5 35. An assembly for use with a printed circuit board (PCB), the assembly comprising:

 a relay assembly including a housing, at least one normally closed contact, a trip free reset assembly, linked to other relay components for manually resetting the relay after the relay is tripped, a manual trip assembly linked to other
10 relay components for manually tripping the relay when the relay is set and a manual open circuit assembly linked to other relay components for manually momentarily opening the at least one normally closed contact, each of the manual trip, reset and open circuit assemblies including an interface member for activating the associated
15 open circuit assemblies mounted within the housing; and

 at least one pin linked to at least one of the relay components and including a distal end suitable for direct connection to the PCB.

 36. The assembly of claim 35 wherein the relay assembly is a bi-stable relay assembly.